A CLOSER LOOK SERIES

NORTH AMERICAN RAIL COVERED HOPPERS

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EXECUTIVE SUMMARY

Covered hopper 2016 traffic totaled x carloads.

The agricultural and food industry generates x% of total covered hopper traffic. Grain is largest commodity group, accounting for x% of this segment's carloads.

The petro-chemical industry accounted for x% of all covered hopper shipments. Plastic pellets carloads were x% of this traffic segment.

The mining and manufacturing industries originates x% of the covered hopper traffic base, of which x% are sand, non-metallic minerals, and cement shipments.

CAR TYPE SEGMENTS

The covered hopper fleet currently consists of x cars and averages x trips per year. About x% are single car shipments and x% are unit trains of 50 cars or more. The average age of the overall fleet is x years old.

Gravity cars make up x% of the fleet, or x cars, and average x trips per year. About x% of these shipments move in unit trains of 50 cars or more. Leasing companies own x% of these cars, followed by the railroads at x%, and shippers making up the balance. This fleet is x years old on average.

The Pneumatic fleet totals x cars, or x% of all CHs, and are used almost exclusively for plastic pellet shipments. This fleet is owned entirely by shippers and leasing companies, and averages x trips per year. About x% of the carloads are single car shipments. The pneumatic fleet has an average age of x years.

Pressure Differential and Specialty covered hoppers account for the remaining x% of the fleet, or x cars. This fleet has a broad commodity base and is owned mainly by the leasing companies, x%, with the railroads and shippers splitting the balance. Utilization of the PD and Specialty fleets are x and x trips per year, respectively; and approximately x% of carloadings are single car shipments. The PD fleet averages x years in age and the Specialty fleet is x years old.
EXECUTIVE SUMMARY

Deliveries of new covered hoppers in 2017 are forecast to total x units, down x% y/y. In 2018, deliveries are forecast to drop an additional x% to x cars, and increase x% to x cars in 2019.

The <3500 cuf segment will account for x of the 2017 deliveries. In 2018, this share will rise to x%, and continue to increase to x% by 2019.

Meanwhile, the grain driven 3500-5500 segment will increase from a x% share in 2016, to x% in 2017 and x% in 2018, but is forecast to begin a subtle decline to x% by 2020.

The >5500 cuf segment is forecast to decrease its share of new CH deliveries from x% in 2016 to x% in 2017, before a sharp decline in 2018 to x%.

The main driver of the >5500 cuf segment will be deliveries of Large Pneumatic CHs to serve the plastics industry. However, the Large PD (agricultural & light weight minerals) and Super Gravity CHs (DDG) are also included in this segment and will contribute to the demand for new >5500 cuf CHs.

New car deliveries are forecast to slightly outpace retirements over the next three years; however the build to retirement ratio will remain close to x-to-1 ratio. This will result in a x% increase in the fleet size by the end of 2021, or a 0.5% AAGR in the 2017-2021 period, to x cars.

The CH surplus increased dramatically between 2014 and 2016, from just x cars to x. High delivery volumes and oversupplied equipment markets, combined with improved rail network velocity are largely responsible for utilization decline. A slight improvement is expected over the forecast period.

Retirements in 2016 totaled nearly x cars, up from x in 2015. Owners chose to scrap underutilized, suboptimal equipment rather than incur high storage costs. Retirements were largely concentrated in the aging, 263k Grl portion of the fleet.
JUMBO GRAVITY (5001-5500 CUF)

**FLEET DEMOGRAPHICS**

**CHARACTERISTICS.** The Jumbo Gravity CH fleet includes cars with 5001-5500 cuf capacities. As the largest Gravity car segment, the fleet currently totals x cars and has been heavily invested in over the past fifteen years since the introduction of 286k Grl.

**CAPACITY.** About x% of the cars are 286k Grl, with the small remainder a combination of 263k and 268k cars.

Approximately x% of these cars have cubic capacities of 5000-5249 cuf, with the 5250-5499 cuf cars accounting for the remaining x% of the Jumbo Gravity fleet.

**Jumbo Gravity Covered Hopper**

*2017 Fleet Size*

Source: Umler, AllTranstek; x cars

**JUMBO GRAVITY CH GRAIN / FCA**

**AGE.** The average age of this fleet is x years and x% of the cars are less than x years old. The median car is only 1x-years old and was built in xxxx. This fleet has been heavily invested in over the last 15 years due to the fact that it includes the 5150 cuf grain car which is the 286k Grl replacement for the 4750 cuf, 263 Grl grain car. Almost x% of this fleet is less than x years old and less than x% of the fleet was built prior to 1974.

**COMPONENTS.** About x% of the Jumbo Gravity cars have trough hatches, with standard/round hatches making up only x% of the fleet. The small remainder of the cars are have combination or rectangular roof hatch types.

**5200 COVERED HOPPER CAR / GREENBRIER**

Source: Umler; x cars
JUMBO GRAVITY (5001-5500 CUF)

Almost x% of Jumbo Gravity cars have 3 compartments and 3 bottom outlets.

About x% of Jumbo cars are unlined, while x% have synthetic interior linings. About x% of the Jumbo fleet is equipped with vibrator brackets.

Ownership. Lessors own x% of this segment, while railroads own x% and shippers own x%.

Wells Fargo Rail alone owns x% of the total Jumbo Gravity fleet. CIT Rail is the next largest lessor owner with a x% share overall. Combined, these two leasing companies own x Jumbo Gravity cars.

BNSF owns by far the largest share of railroad owned Jumbo Gravity cars, with x%, or x% overall. UP owns x% of the railroad owned Jumbo Gravity fleet.

DATA METRICS

Gravity Covered Hopper - Jumbo
By The Numbers

COMMODITIES

Shipments for the Jumbo Gravity fleet in 2016 were x carloads, or x% of all CH shipments.

The top 5 commodities that make up x% of all Jumbo Gravity traffic are corn, wheat, soybeans, flour/meal, and soda ash, with shares of x%, x%, x%, x%, and x%, respectively.

Unit trains of 100 or more cars move x% of Jumbo Gravity shipments. An additional x% of Jumbo Gravity shipments move in single car service.
JUMBO GRAVITY (5001-5500 CUF)

Jumbo Gravity cars began the recession averaging x trips per year and totaling nearly x million carloads in 2007. By the end of the recession in 2009, trips per year slid slightly to x while carloads managed to climb up to x million. This growth trend increased in 2010 after the end of the recession but has since decreased before rising again in 2014.

Between 2010 and 2013, trips per year fell from x to x. By 2016, trips per year increased to x, which nevertheless is lower than the average during the recession.

Carloads reacted to the recession in the same way as trips per year, increasing through 2010 before beginning to descend in 2011. Traffic hit its post-recession low point in 2013 with x million carloads but began to increase again in 2014, climbing to a total of more than x million carloads in 2016.

MARKET CONDITIONS

The jumbo gravity covered hopper car has been the primary grain type car produced over the last 25 years. This fleet is displacing the smaller 4750 fleet for the majority of grain commodity services. Grain transportation demand has seen a relatively stable environment for the last several years, which can be seen in the carloadings results. However, the car supply/demand balance has softened as continued introduction of new jumbo grain cars has taken place at high volumes, due to order conversion. Sizable volumes of jumbo grain cars in builder backlogs should keep pressure on lease rates.

Railroad performance has also put pressure on lease rate over the past year. A return to more normalized operating performance levels should increase car demand for some shippers.

FLEET GROWTH

The Jumbo Gravity fleet began the 2013-2016 period with x cars, or x% of all CH cars. After x deliveries vastly outnumbered x retirements, the segment reached a total of x cars by January 2017. Deliveries within this segment accounted for x% of new cars and x% of retirements during the period.

This fleet is projected to experience a high rate of investment in the upcoming forecast period. The retirement rate in the Jumbo fleet will be low over the next few years, since there are relatively few older cars in this young fleet. Retirements within this segment will represent just x% of all CH retirements. The Jumbo Gravity fleet has grown over the past few years, a trend which is expected to continue through the 2017-2021 period.

New car demand is projected to total about x cars over the 2017-2021 period and will outpace retirements, projected to be x cars, by a x-to-1 ratio. As a result, the Jumbo Gravity fleet is projected to grow by a total of x%, to x cars.
This fleet is almost entirely built to 286k Grl capacity. Few retirements are expected within the segment over the short term forecast, and retirements are only expected to begin in earnest for this fleet approximately 20 years from now.

Cars of this type are widely available for lease from operating lessors. At the present, there is softness in lease rates, primarily due to railroad performance improvements since 2014, combined with the continued entry of new cars into the marketplace. Much of the surplus in the gravity covered hopper car market has migrated to the sub-optimal 4750 fleet. Despite the fact that the Large Gravity fleet is taking the brunt of hit on utilization, the oversupply situation has still created downward pressure on Jumbo Gravity lease rates.

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Jumbo Gravity cars have commanded a dominant share of the new car builds for covered hopper cars since the introduction of the 5150 roughly 25 years ago. This car type is the new workhorse of the grain industry and maintains growth potential as Large Gravity cars are retired due to age over the next two decades. The Jumbo Gravity car is expected to remain the standard grain car type within the rail industry for the foreseeable future.

Jumbo Gravity cars will make up x% of the total CH fleet in 2022, a larger share than any other segment of Covered Hoppers.

FLEET OUTLOOK

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The jumbo gravity fleet should continue to grow as grain carloads transition to 286k Grl equipment at the expense of the large gravity fleet. Carload growth has justified continued production of jumbo cars, but the fleet reached relative equilibrium in 2011. Fleet growth has since outpaced freight growth, and softness in the equipment market became evident in 2015 and 2016 as order conversions from a diminishing tank car market to jumbo gravity hoppers insti-